

FIG.1

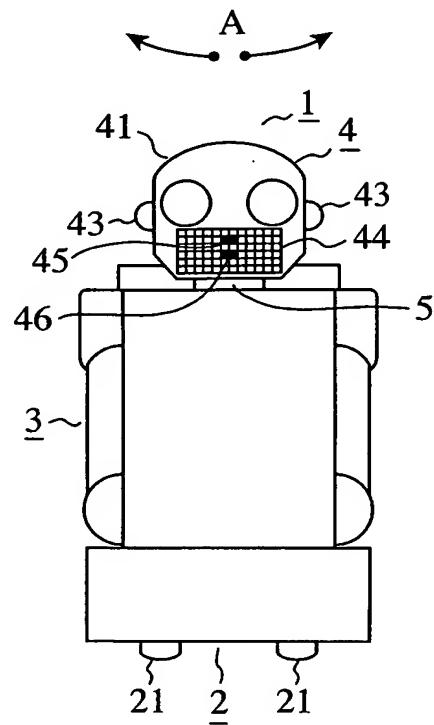


FIG.2

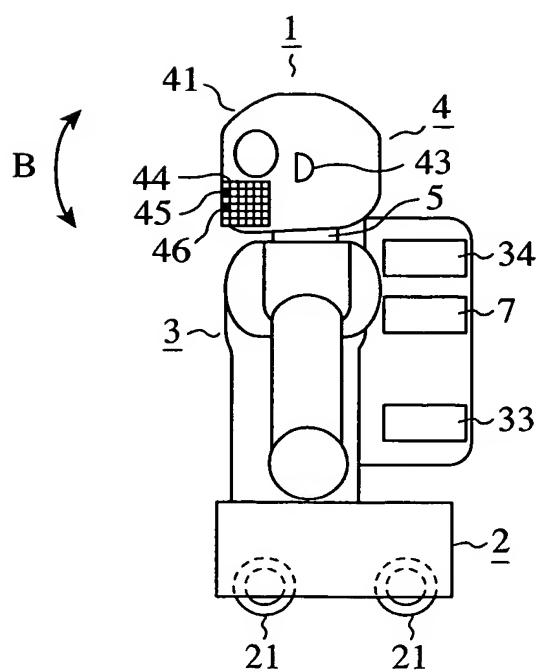


FIG.3

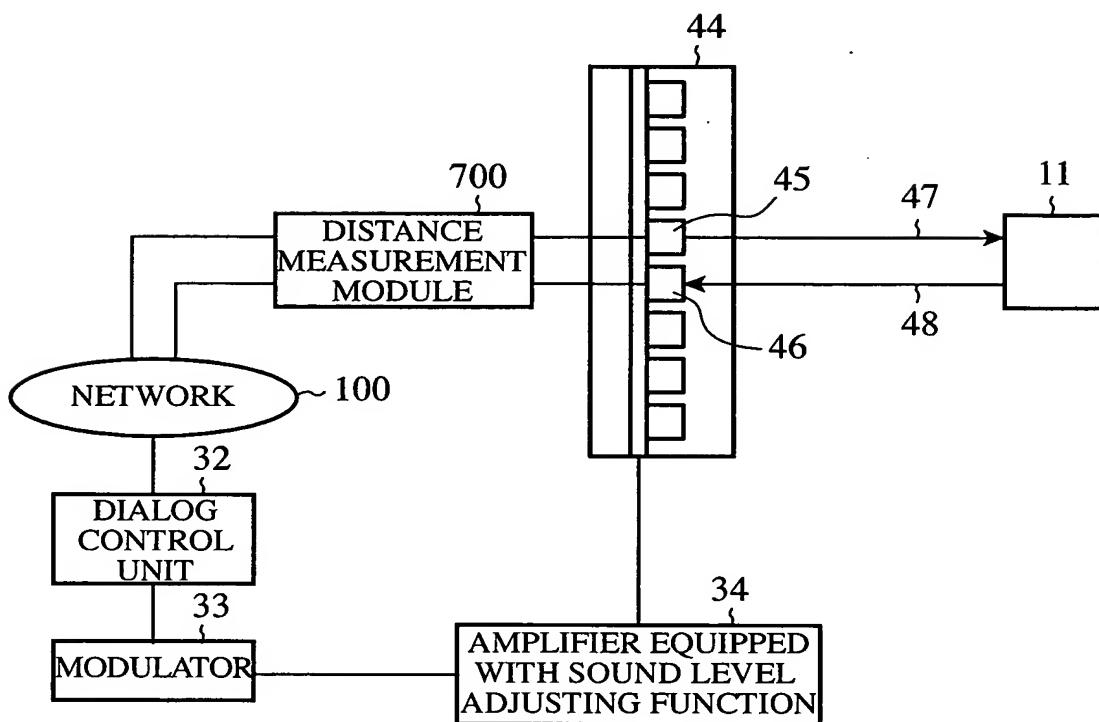


FIG.4

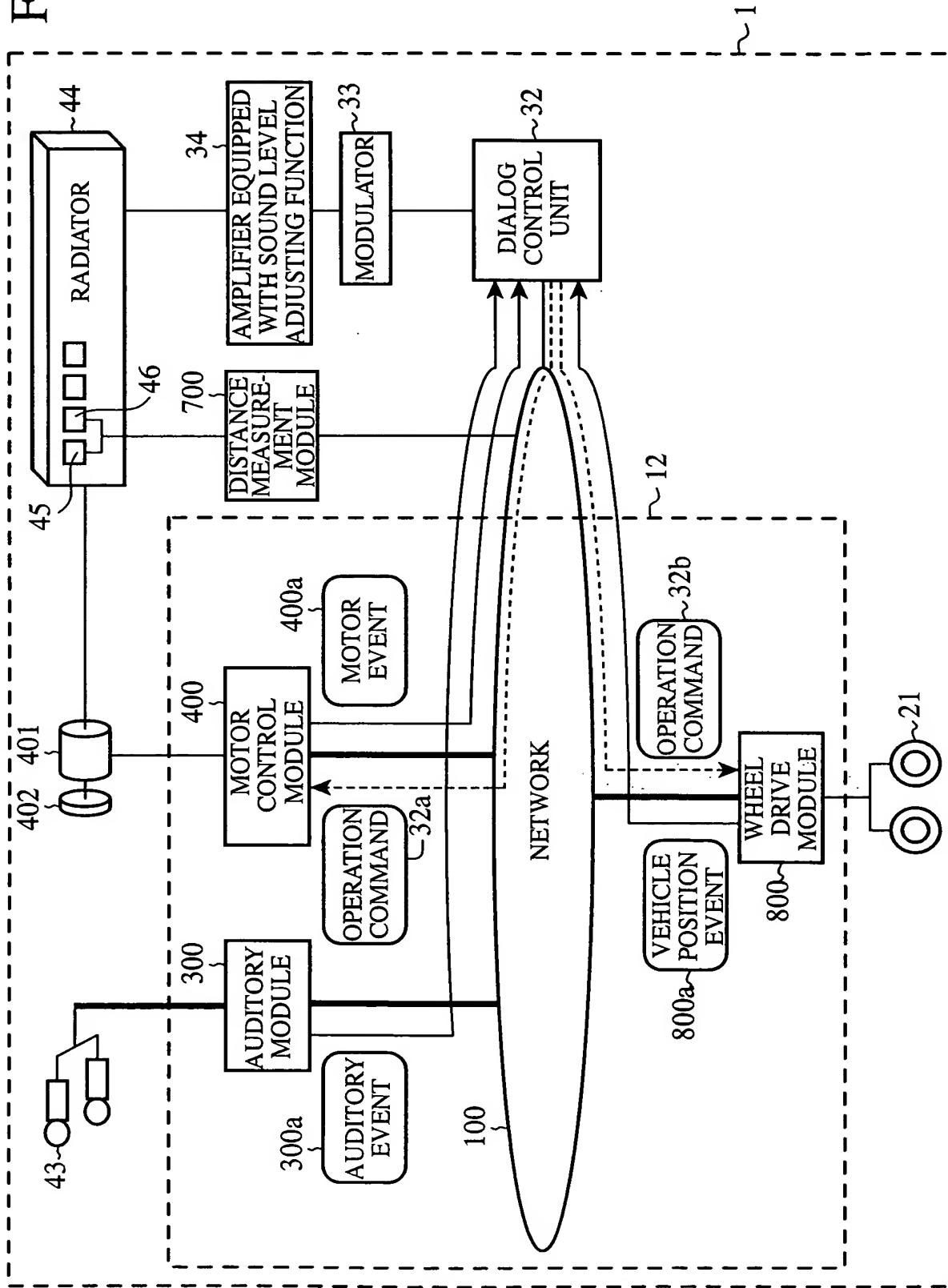


FIG.5

ANGLE OF INCIDENCE = ANGLE OF REFLECTION

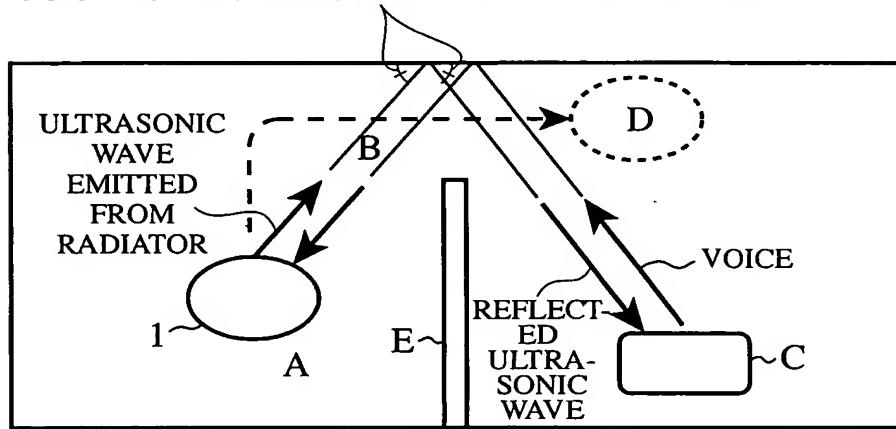


FIG.6

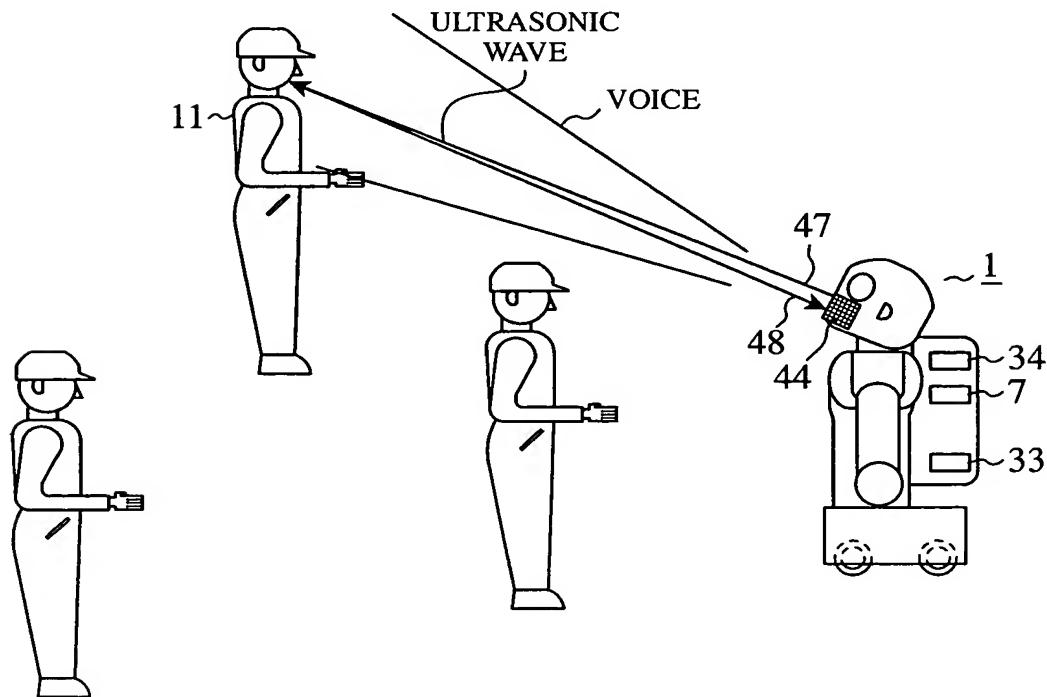


FIG.7

(a) NONDIRECTIONAL SPEAKER (b) ULTRA-DIRECTIONAL SPEAKER

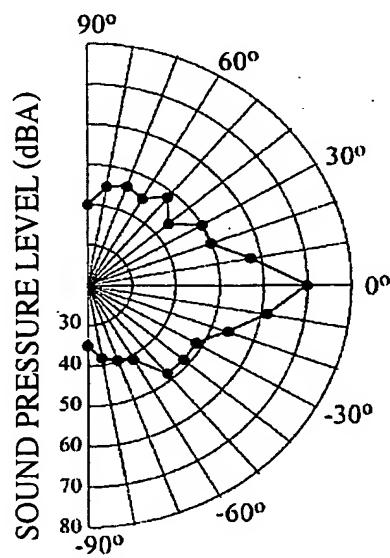
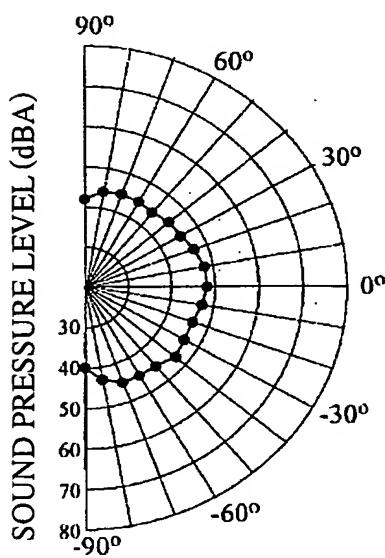
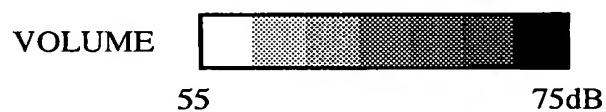
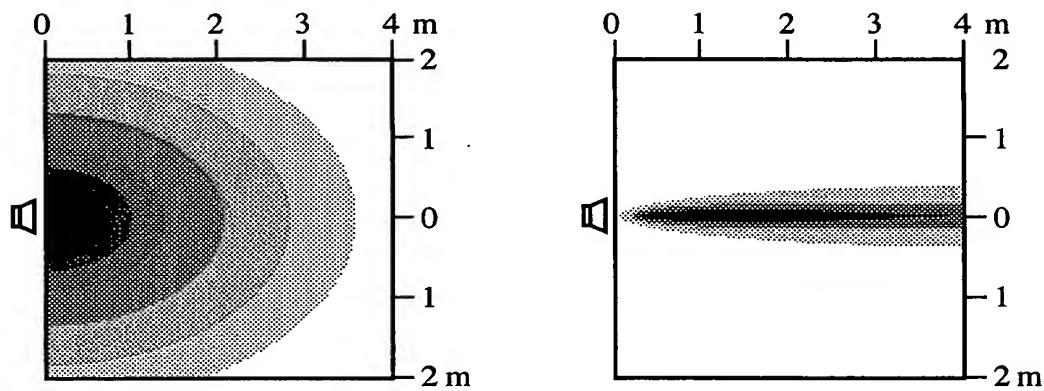


FIG.8

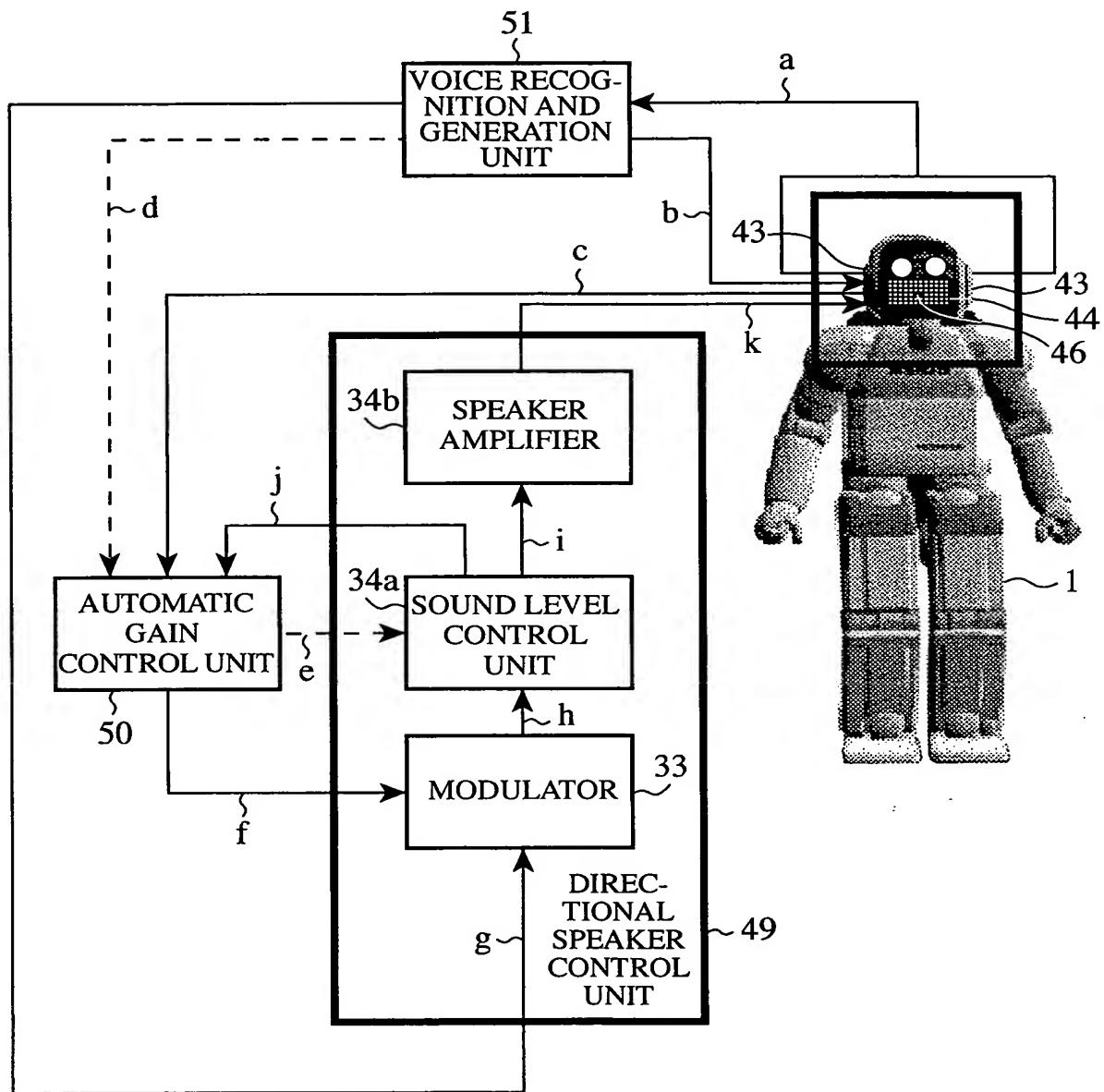
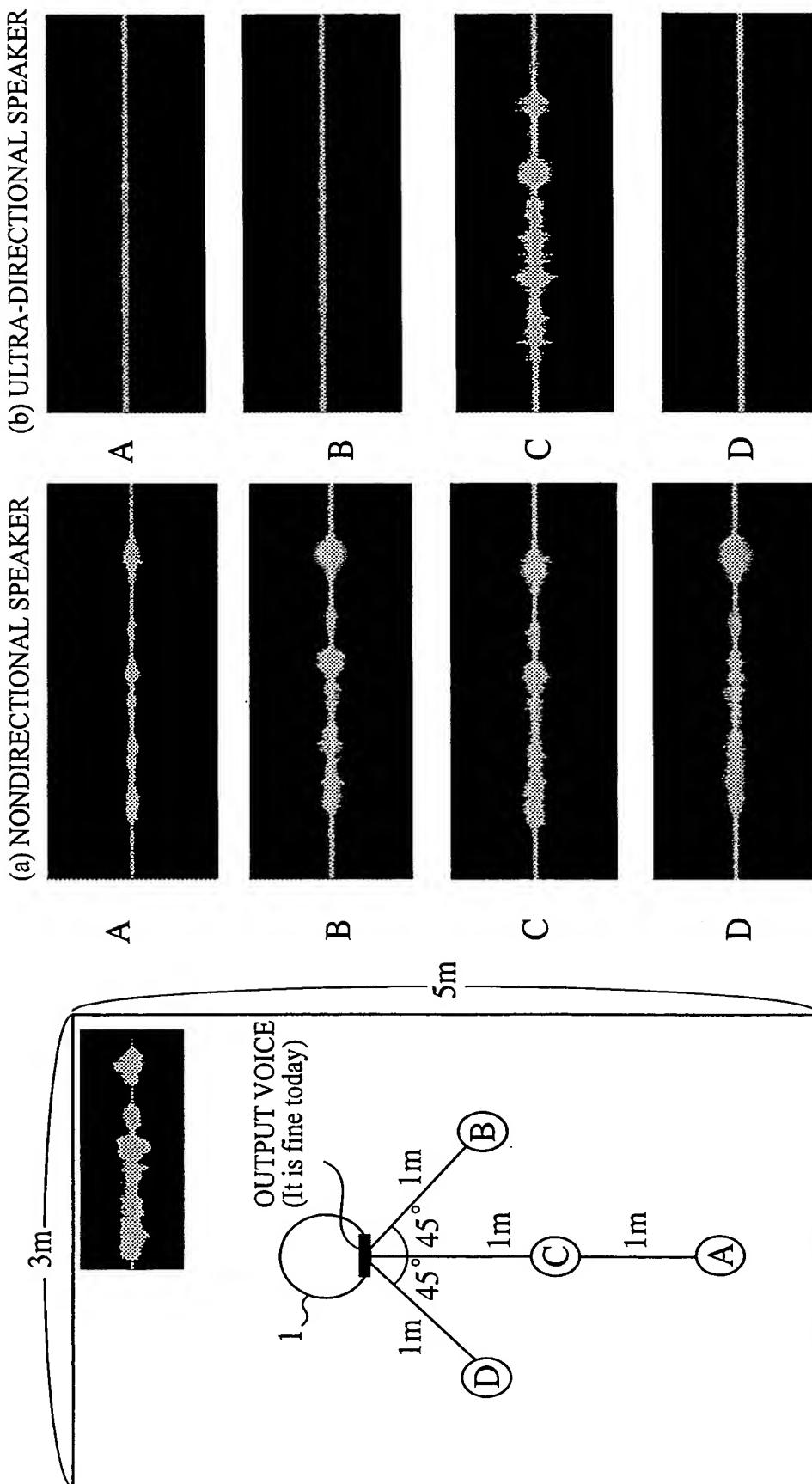


FIG. 9



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FIG.10

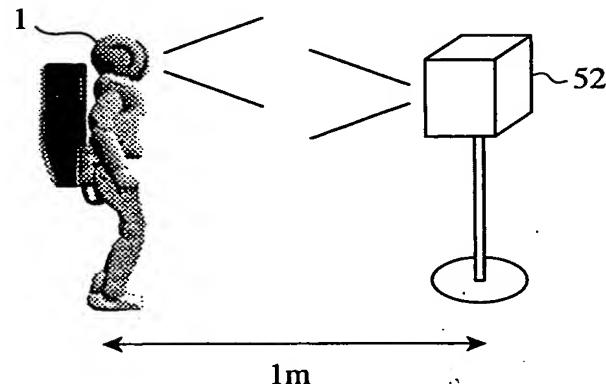


FIG.11

ROBOT-SIDE SPEAKER		
NONDIRECTIONAL SPEAKER	70dBA	62dBA
ULTRA-DIRECTIONAL SPEAKER (MAXIMUM OUTPUT)	58dBA	70dBA
ULTRA-DIRECTIONAL SPEAKER (GAIN CONTROL)	56dBA	62dBA
SWITCHING ON OF ROBOT	55dBA	51dBA
BACKGROUND NOISE	23dBA	23dBA

FIG.12

